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Using Sensor Data in NBC Warning and Reporting

Presented by:

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The Problem...

- **There is No Adequate Mechanism for Reporting Sensor Data using the current NBC Warning and Reporting System**
- **The Prediction Procedures Currently Defined in ATP-45(B) Do Not Address the Use of Sensors for Warning Troops**



Reason for this Presentation

- **Looking for suggestions**
 - This is a “work in progress
- **Present Proposed Solutions**
 - U.S. Representative to the ATP-45 working Group asked me to provide a technical paper for presentation
 - 4 NATO Countries have given tentative approval to these suggestions
 - The suggestions in this presentation will go forward in April



The Reporting System

- **NBC1: Observer's Report**
 - **NBC2: Evaluated Data from NBC1s**
 - **NBC3: Predicted Hazard Area**
-
- **NBC4: Reporting Detections and Survey Results**
 - **NBC5: Actual Contamination**
-
- **NBC6: Detailed Information on CBRN Event**
 - **Also, NBC SITREP, Strike Warn, and Wx Messages**



OptiMetrics Proprietary

NBC 1 Report Format (NBCWaRN)

BioChem1 Report [Minimize] [Maximize] [Close]

File Views Tools [Help]

[Save] [Print] [Export] [Refresh] [Eraser] [Move] [Help]

BioChem1 Report Header

NBCEVENT/ CHEM [Redacted] //

ALFA/ [Redacted] [Refresh] [Redacted] [Redacted] [Redacted] //

BRAVO/ [Redacted] [Refresh] [Redacted] DGM //

DELTA/ [Redacted] [Table Icon] [Redacted] [Table Icon] //

FOXTROT/ Location

[Redacted] [Refresh] [Redacted] [Print] [Copy] //

GOLF/ [Redacted] [Redacted] [Redacted] [Redacted] [Redacted] //

INDIA/ [Redacted] [Redacted] [Refresh] [Redacted] [Redacted] 0/0 [Print] [Copy] //

TANGO/ [Redacted] [Redacted] //

YANKEE/ [Redacted] DGM [Redacted] MPS //

ZULU/ [Redacted] [Redacted] C [Redacted] [Redacted] [Redacted] //

GENTEXT/ NBC INFO [Redacted] //

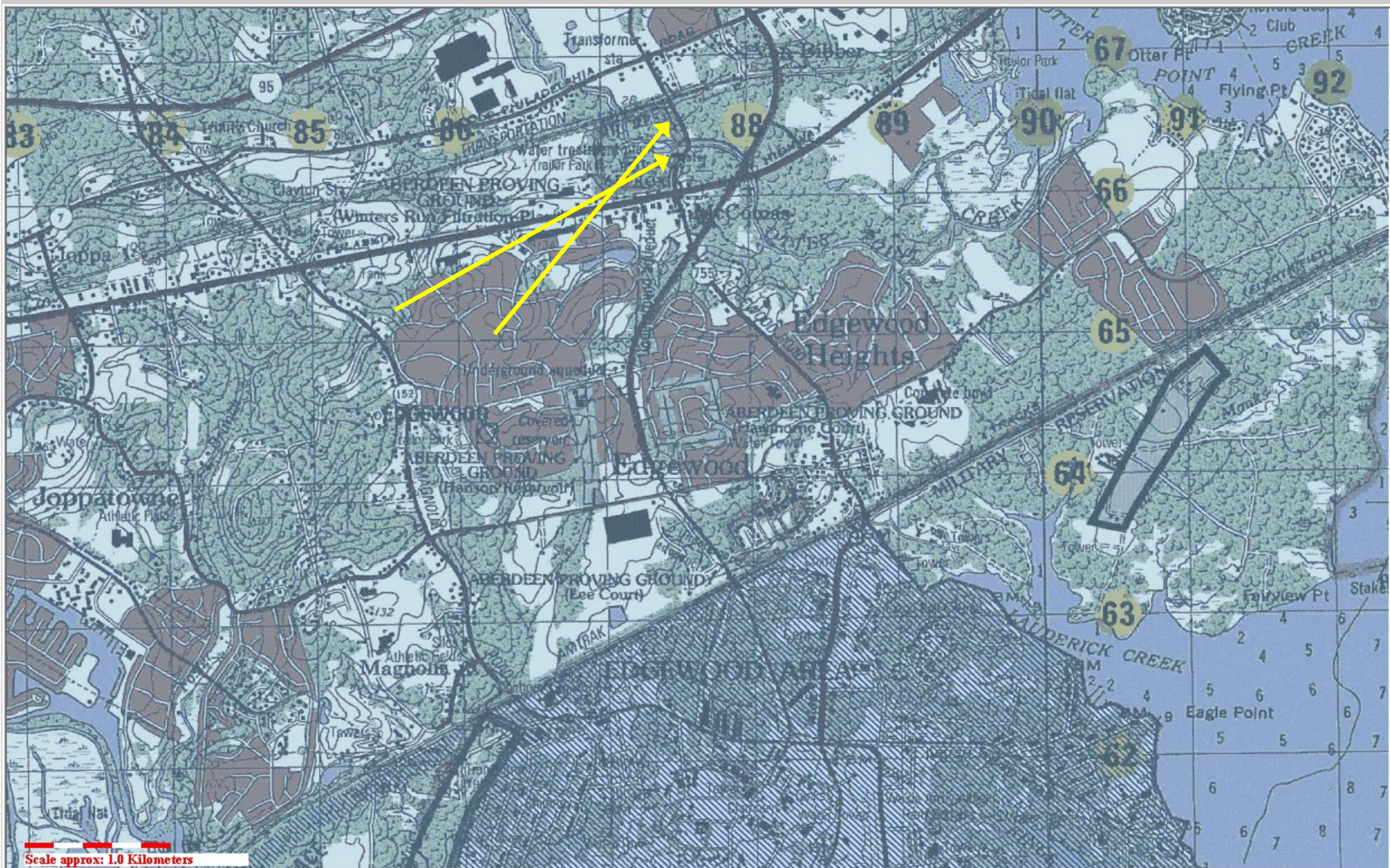


NBC1

- **Mandatory Inputs**
 - ***Location of Observer and Direction of Event (BRAVO)**
 - **FOXTROT the Actual Attack Location**
 - ***DTG of Attack (DELTA)**
 - **DTG of Detection is Not Necessarily the Attack Time**
 - **Suspected or Observed (can be defaulted)**
 - **Type of Delivery System (can be defaulted)**
 - **Type of Container (can be defaulted)**
 - **Air or Surface (can be defaulted)**



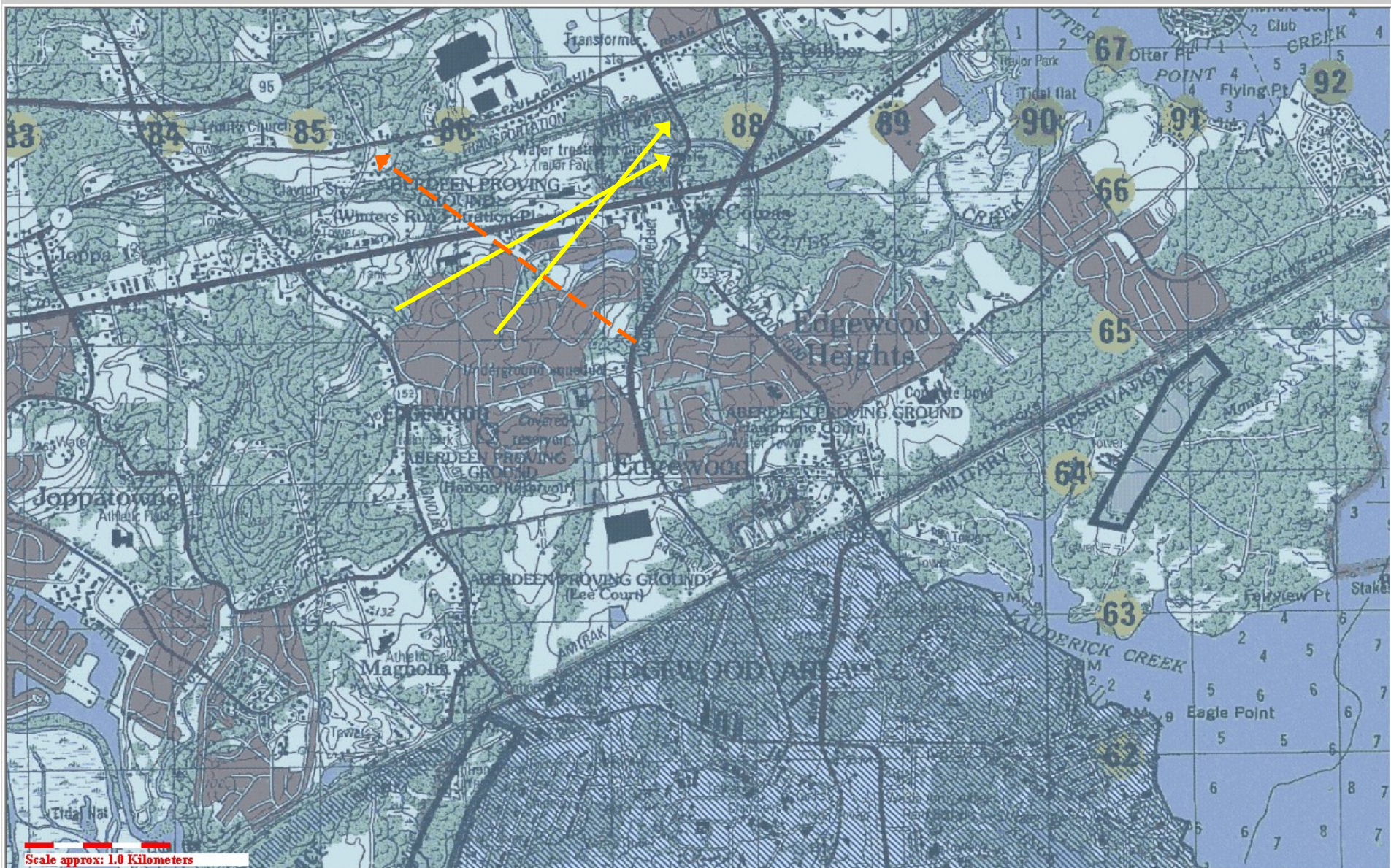
- **Correlation (filter) Process**
 - **Time and Distance**
 - **5-Minute Standard Deviation**
 - **Line of Sight (2000m max)**
 - **Intersection Point is Attack Area**
 - **Compare Delivery Information**
 - **Possible to Use Defaults**

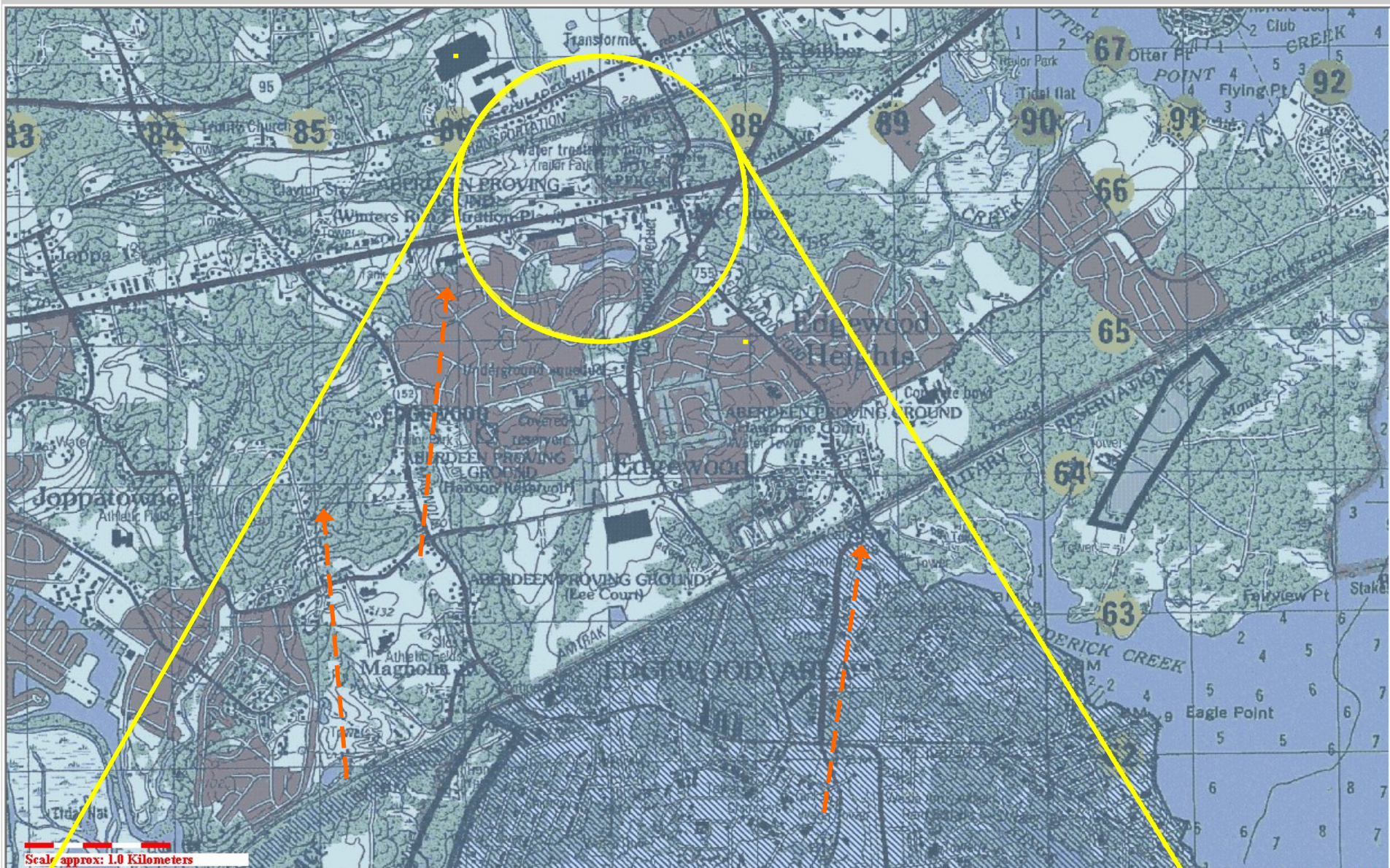




NBC 1 and Sensors

- **Sensor Data**
 - **Detection Occurred and Possibly Agent**
 - **But Not Direction of Attack**
 - **Sensor Location**
 - **Not the Attack Location**
 - **Possible Wx Information**
- **Probably Will Be Thrown Out during Correlation**
 - **Can't Determine Attack Location**
- **Force the Inputs into a NBC 1 Report**
 - **Inverse of the Downwind Direction for Direction of Attack**
 - **Detection Time as Attack Time**







NBC 4 Report

BioChem4 Report [Minimize] [Maximize] [Close]

File Views Tools [Help]

[Save] [Open] [Print] [Refresh] [New] [Help]

BioChem4 Report **Header**

NBCEVENT/ [Red] [Green] //

ALFA/ [Red] [Refresh] [Red] [Red] [Red] [Green] //

INDIA/ [Green] [Green] [Refresh] [Green] [0/0] [Print] [Save] //

Sample Information 1

QUEBEC/ [Red] [Refresh] [Red] [Red] [Green] [FT] //

ROMEO/ [Green] [PPM] [Refresh] [Green] [Green] [Refresh] //

SIERRA/ [Red] [Grid] //

TANGO/ [Red] [Red] //

WHISKEY/ [Green] [Green] [Green] [Green] //

YANKEE/ [DGM] [MPS] //

ZULU/ [C] [Green] [Green] [Green] [Green] [Print] [Save] [Trash] //

GENTEXT/ [NBC INFO] [Green] //



- **Mandatory Inputs**
 - **Location of Sample, Type of Sample & Type of Detection (QUEBEC)**
 - **DTG of sample (SERRA)**



NBC 4 Correlation Procedures

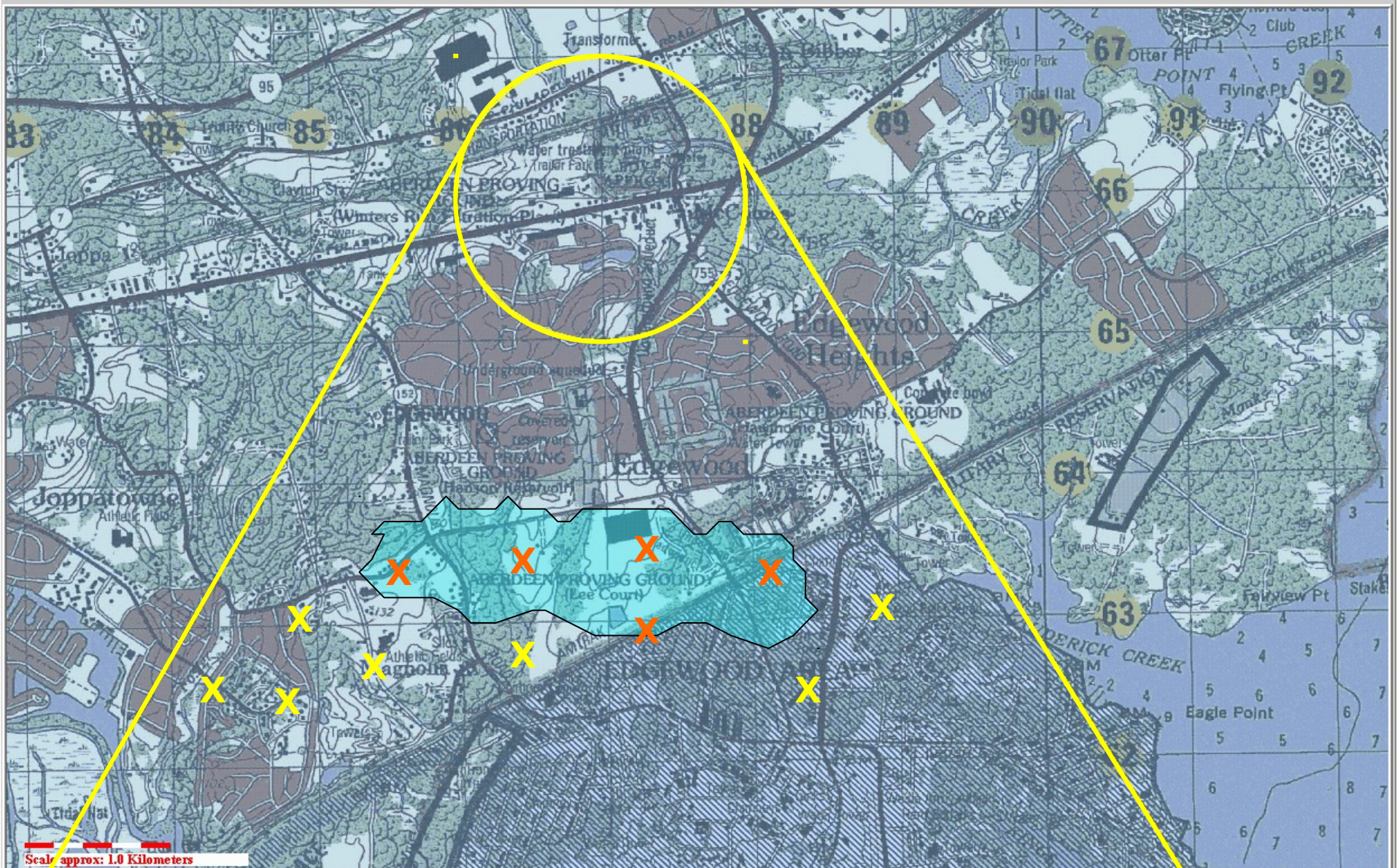
- **Correlation Procedures**
 - **Strike Serial Number**
 - **DTG is Later than NBC 3**
 - **Mean Location within 4000m**

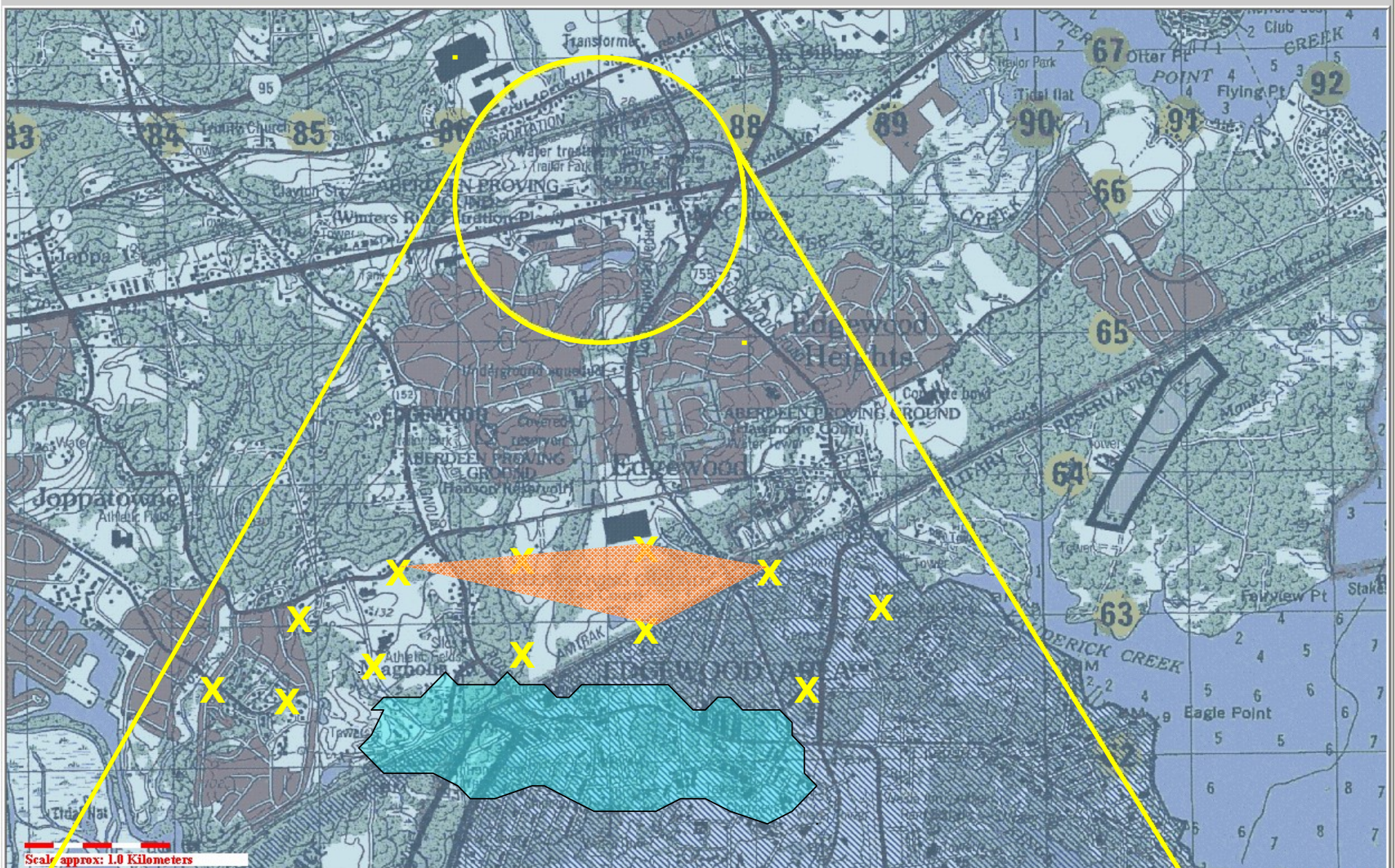


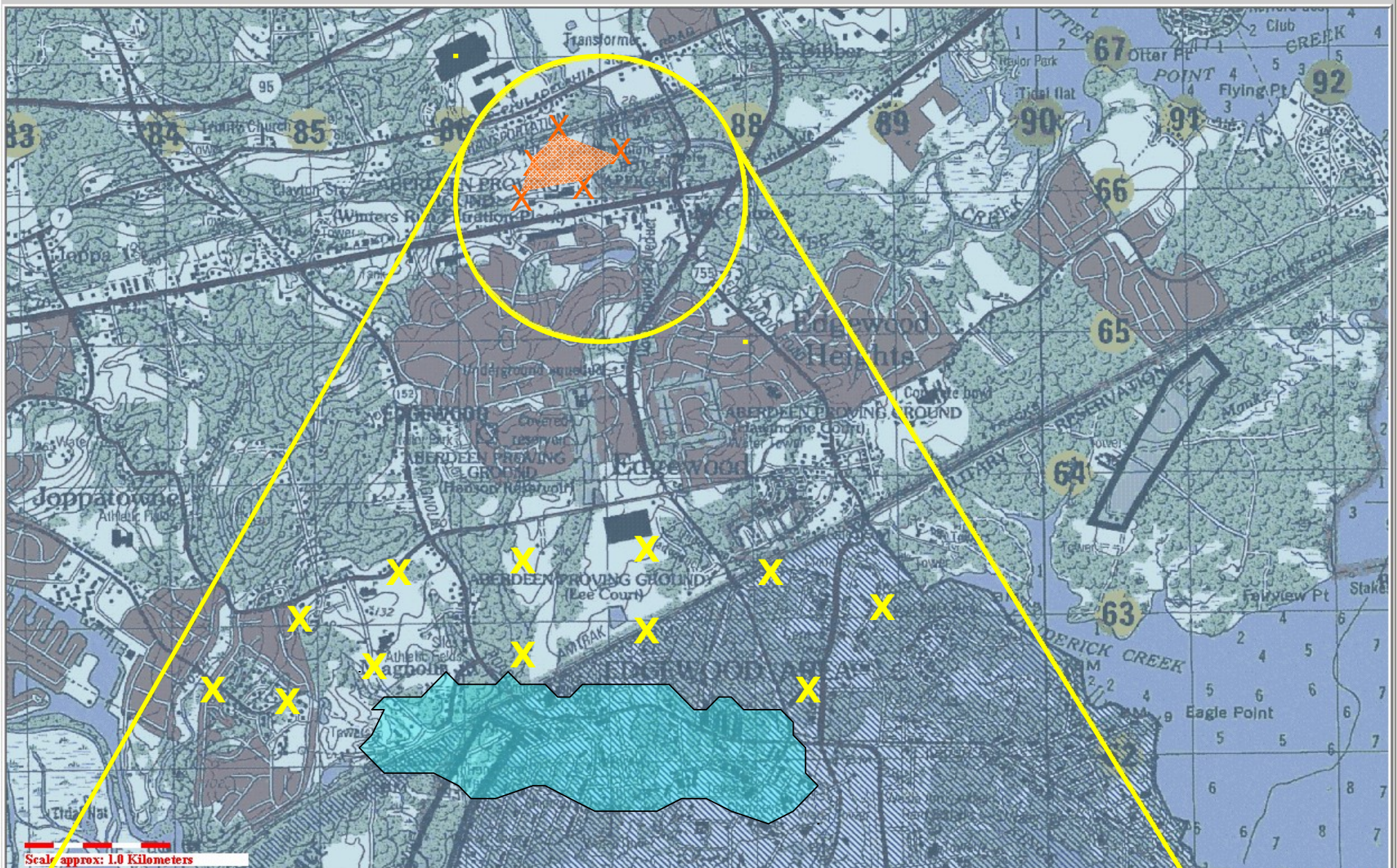
NBC 4

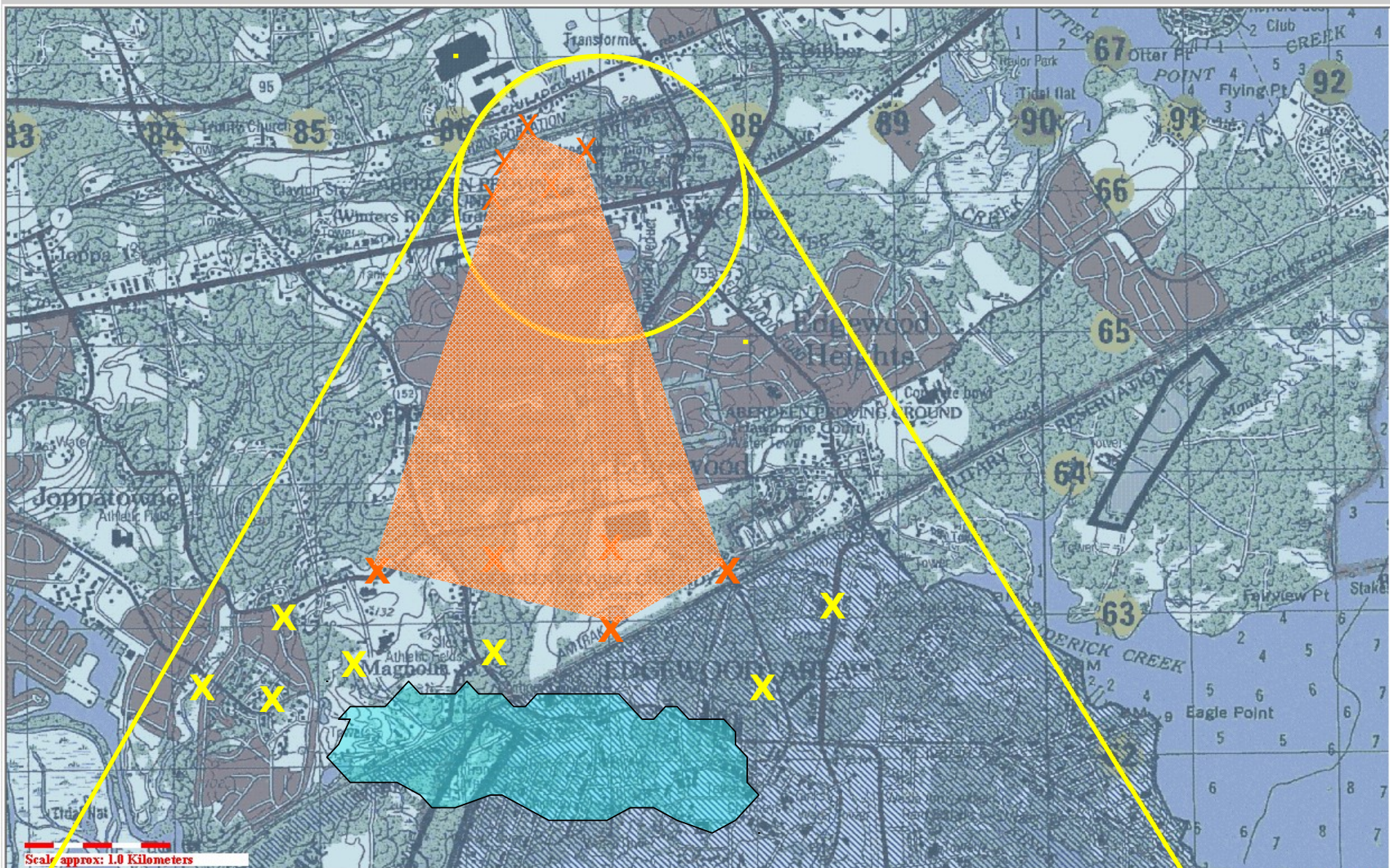
Vapor vs. Ground Contamination

- Sensors Usually Report a Vapor Hazard**
- Original Intent of the NBC 4**
- Conceivably Miss the Attack Area**











Battlefield Sensors

- **What are they good for?**
 - **Verification of Existing Attack**
 - **Current Location of the Vapor Hazard**
 - **De-warning**
 - **Detecting a Hazard when No Attack Has Been Reported (Covert, Spray, Generator)**
 - **For the Local COP**



Technology has Outpaced Doctrine

- **ATP-45(B) and AEP-45 are Automating a Manual Process.**
 - **We are trying to force new technology and new capabilities and automated processes into a manual process.**
- **We need Doctrine that Addresses New and Emerging Capabilities.**
 - **We need procedures based on automated processes, not manual processes.**



Dilemma...

- **NBC 1?**
 - **Not Enough Information**
- **NBC 4?**
 - **OK for Ground Contamination but Not Vapor**
- **Just Local Information?**
 - **For Display on the COP**
 - **If It's in a Known Hazard Area, Don't Report It**



Our Suggestion for a Solution to the Problem

- **Use the NBC 4 as It Exists**
- **Separate Vapor (air) and Liquid (surface) Samples on the NBC 4**
- **Report Both Hazards Annotating One Vapor and One Liquid**
 - **We Need Procedures in ATP-45(B) for Processing Sensor Data**

